This is not going to be a cakewalk like self driving cars. Most of comma's competition is now out of business, taking billions and billions of dollars with it. Re: Tesla and FSD, we always expected Tesla to have the lead, but it's not a winner take all market, it will look more like iOS vs Android. comma has been around for 10 years, is profitable, and is now growing rapidly. In self driving, most of the competition wasn't even playing the right game.

This isn't how it is for ML frameworks. tinygrad's competition is playing the right game, open source, and run by some quite smart people. But this is my second startup, so hopefully taking a bit more risk is appropriate.

For comma to win, all it would take is people in 2016 being wrong about LIDAR, mapping, end to end, and hand coding, which hopefully we all agree now that they were. For tinygrad to win, it requires something much deeper to be wrong about *software development in general*.

As it stands now, tinygrad is 14556 lines. Line count is not a perfect proxy for complexity, but when you have differences of multiple orders of magnitude, it might mean something. I asked ChatGPT to estimate the lines of code in PyTorch, JAX, and MLIR.

- JAX = 400k
- MLIR = 950k
- PyTorch = 3300k

They range from one to two orders of magnitude off. And this isn't even including all the libraries and drivers the other frameworks rely on, CUDA, cuBLAS, Triton, nccl, LLVM, etc…. tinygrad includes every single piece of code needed to drive an AMD RDNA3 GPU except for LLVM, and we plan to remove LLVM in a year or two as well.

But so what? What does line count matter? One hypothesis is that tinygrad is only smaller because it's not speed or feature competitive, and that if and when it becomes competitive, it will also be that many lines. But I just don't think that's true. tinygrad is already feature competitive, and for speed, I think the bitter lesson also applies to software.